

The Future of Electronics Recycling and Disposal

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Florida Department of
Environmental Protection

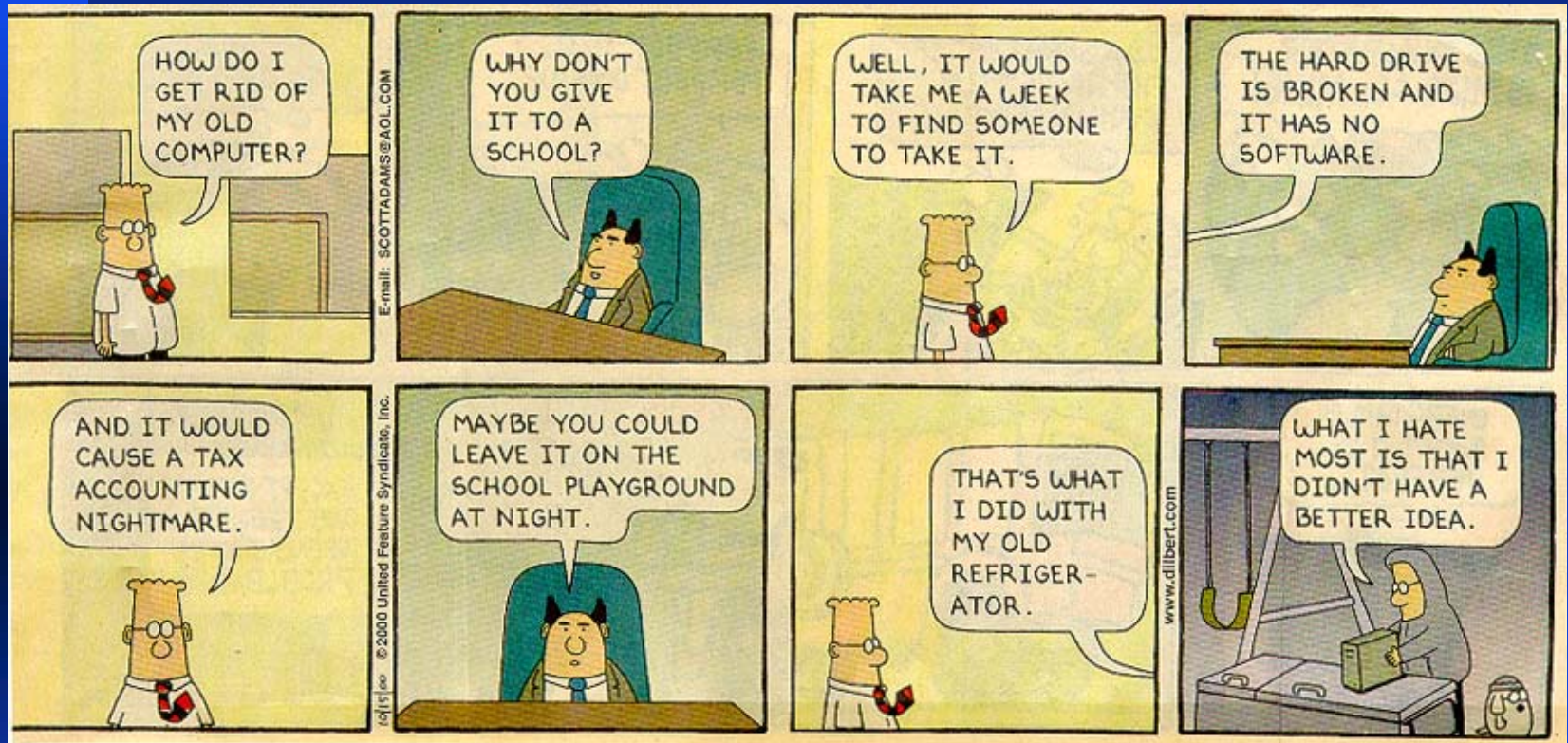
October 15, 2003

10th Annual

Environmental Essentials Workshop

Miami, Florida

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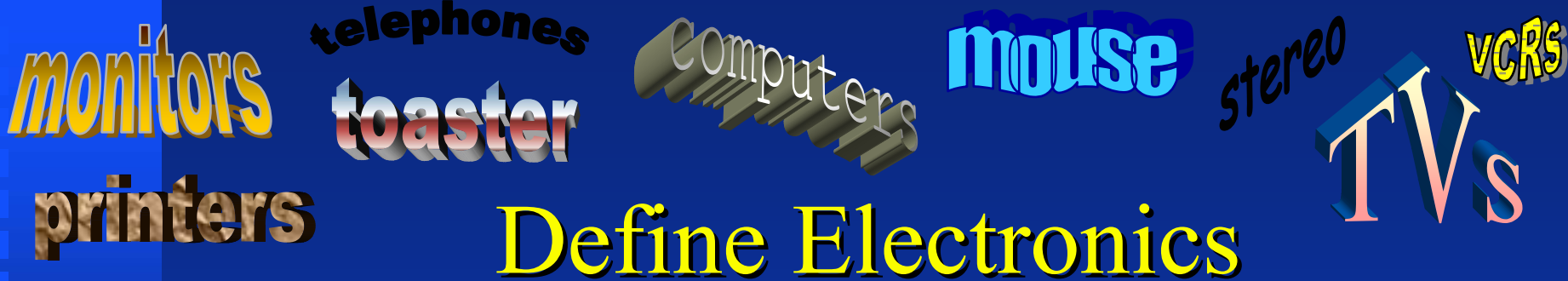
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“This is great! Now I can finally get rid of the damn thing.”

- Participant at 10/4/2003 Florida electronics recycling event

The Case for Recycling Electronics

- Reuse valuable materials
- Conserve landfill space
- Prevent release of toxics to the environment (water)
- “It’s the right thing to do”



■ Range of definitions

- ‘Everything with a cord’ to CRTs

- DEP (9 categories for grants)

- | | |
|---|---|
| 1. Monitors/terminals | 6. Small computer peripherals
(keyboards, mice, cables) |
| 2. TVs >19" | 7. Telecommunication devices |
| 3. TVs <19" | 8. Video/Audio equipment |
| 4. CPUs/laptops | 9. Small household electronics
(small kitchen appliances,
tools, beauty appliances) |
| 5. Large computer
peripherals (printers,
copiers, fax machines) | |

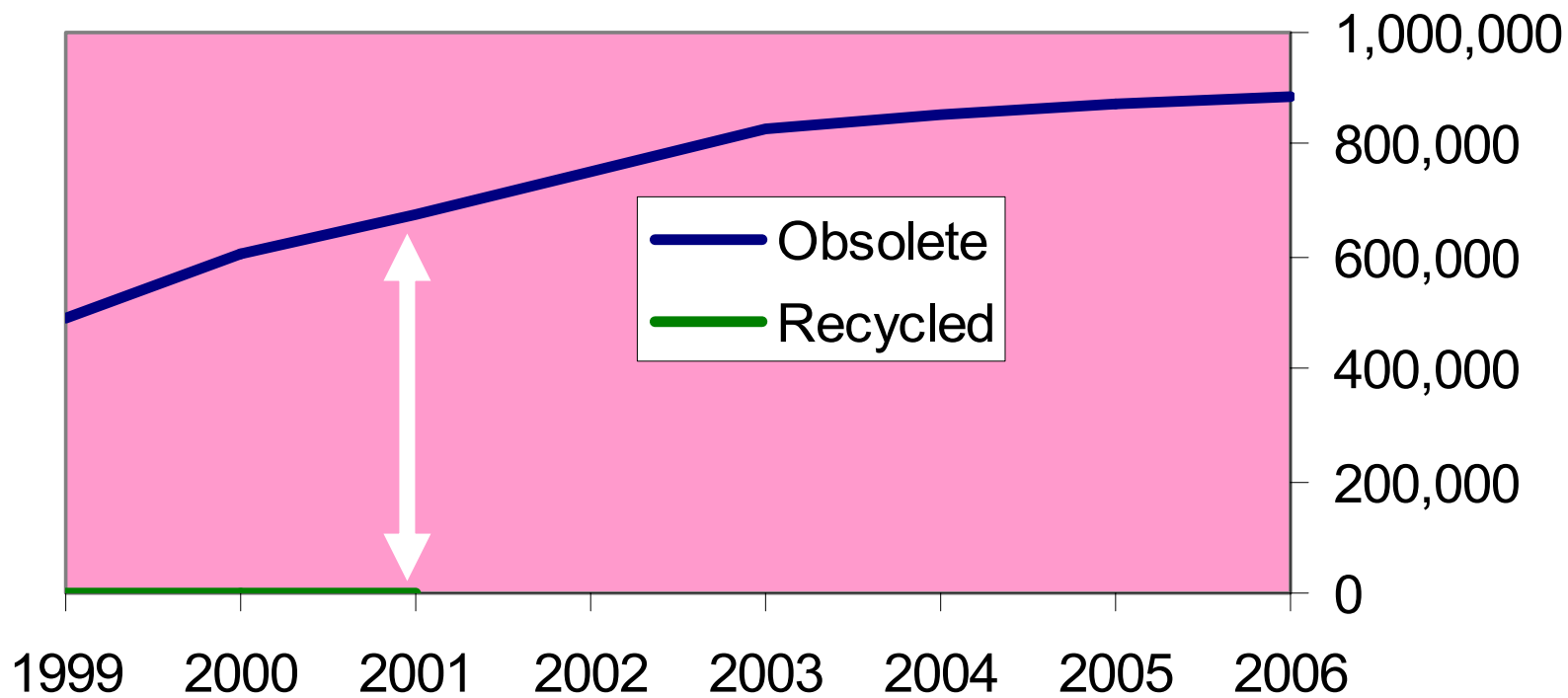
Florida Electronics Recycling

- Streamline regulations
- Promote recycling infrastructure
- Time-limited county funding
- Partnerships
 - Manufacturers, Retailers
 - Non-profits

CRTs: TVs



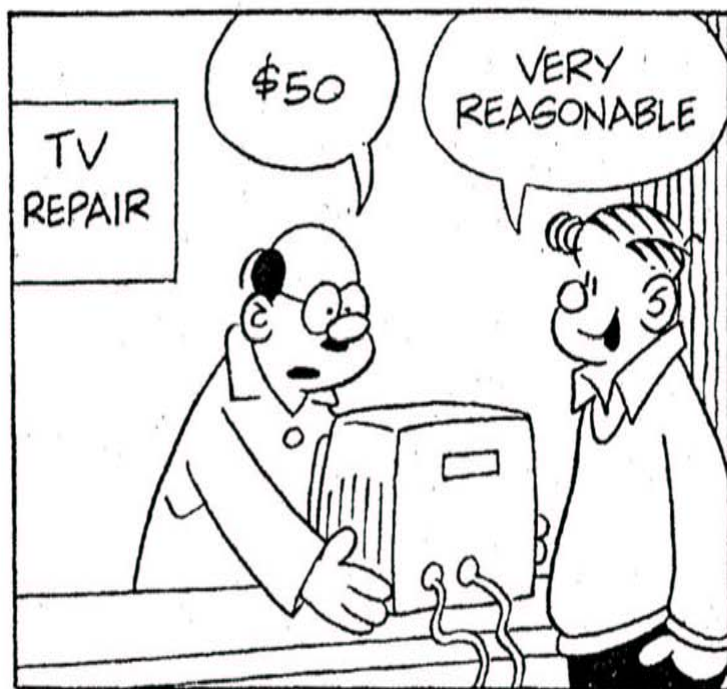
TVs in Florida



FACTOID

- Estimated TV discards into Florida landfills may increase from 830,000 in 2003 to as many as 890,000 in 2006 unless recycling increases from today's 1-5% rate (DEP 2003)

HI AND LOIS



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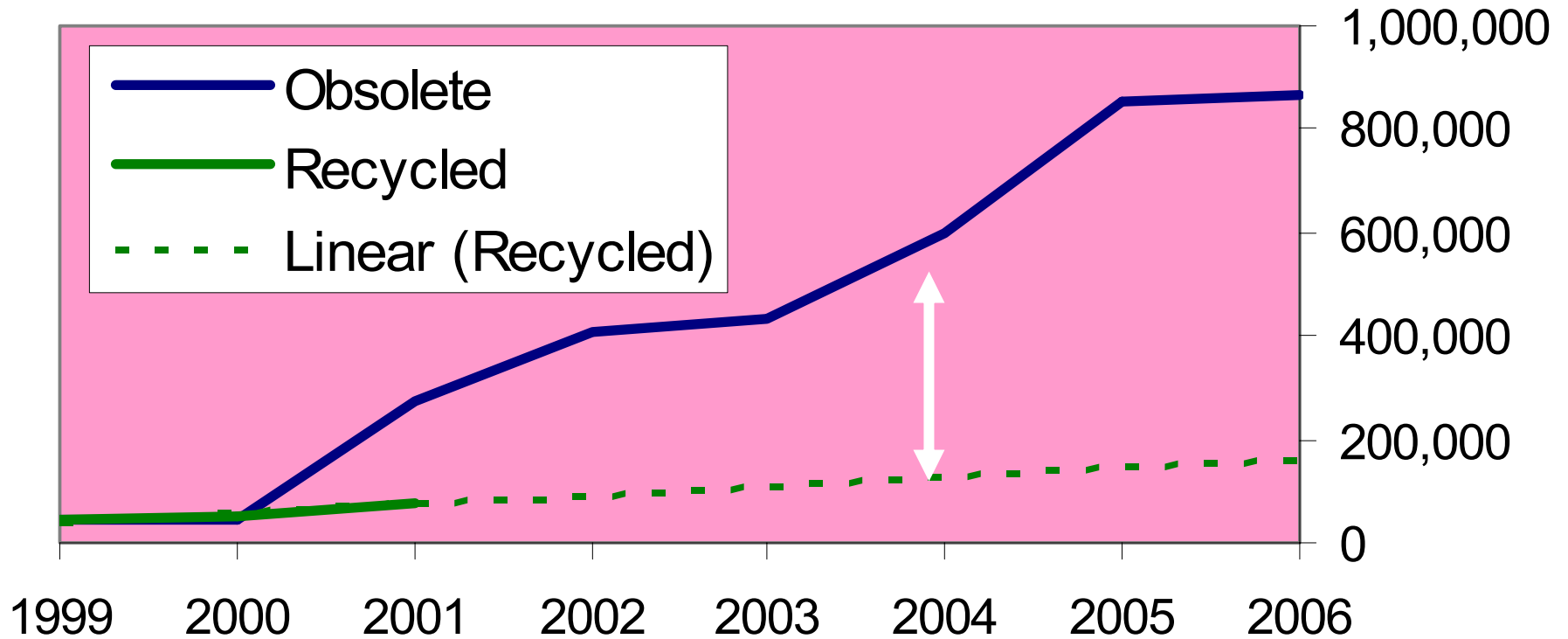


CRTs: Computer Monitors



8/12/1999

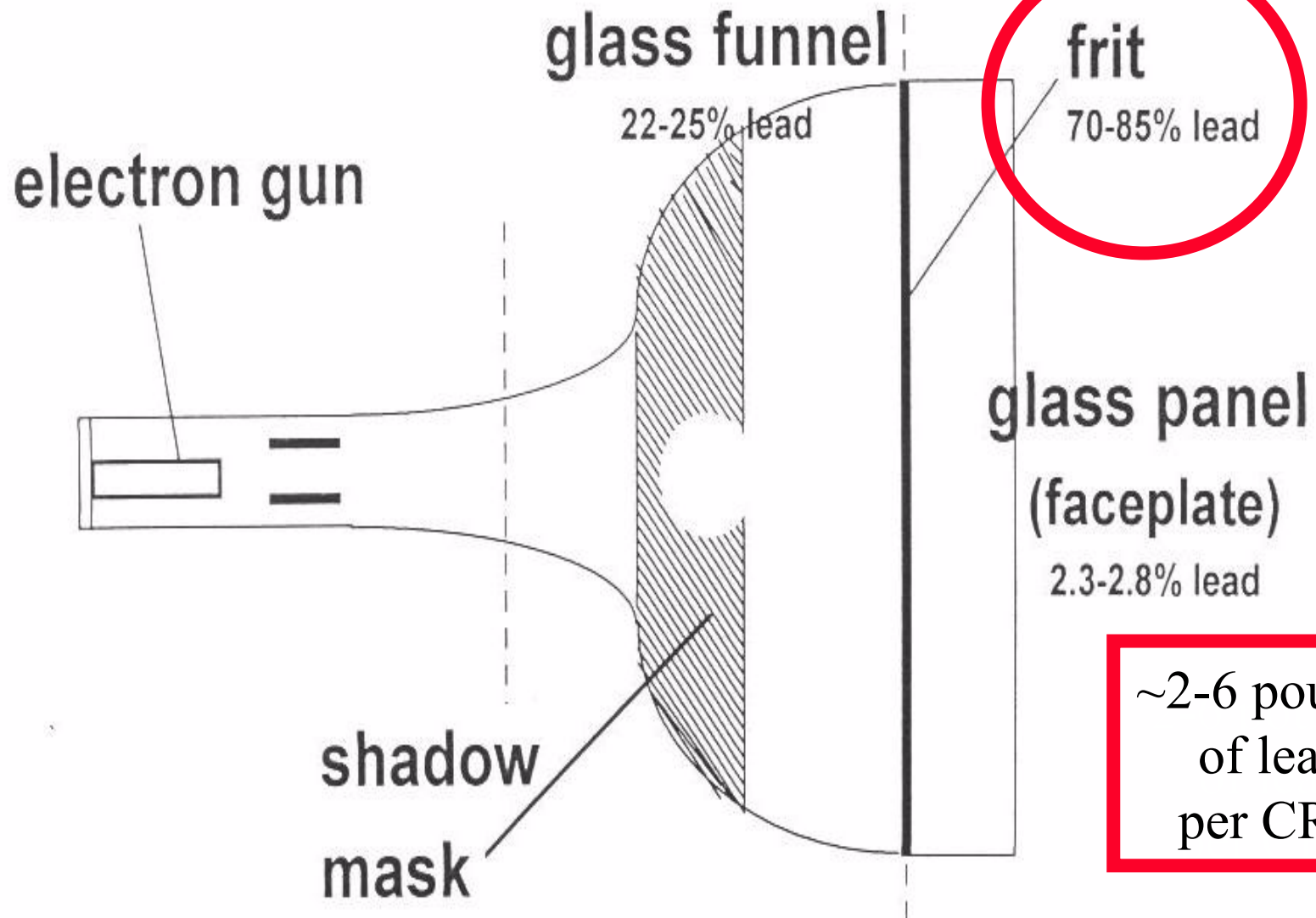
Computer Monitors in Florida



FACTOID

- In 2003, an estimated 220,000 computer MONITORS will be discarded into Florida landfills, 210,000 recycled and as many as 1,470,000 in storage for eventual discard or recycling (DEP 2003)

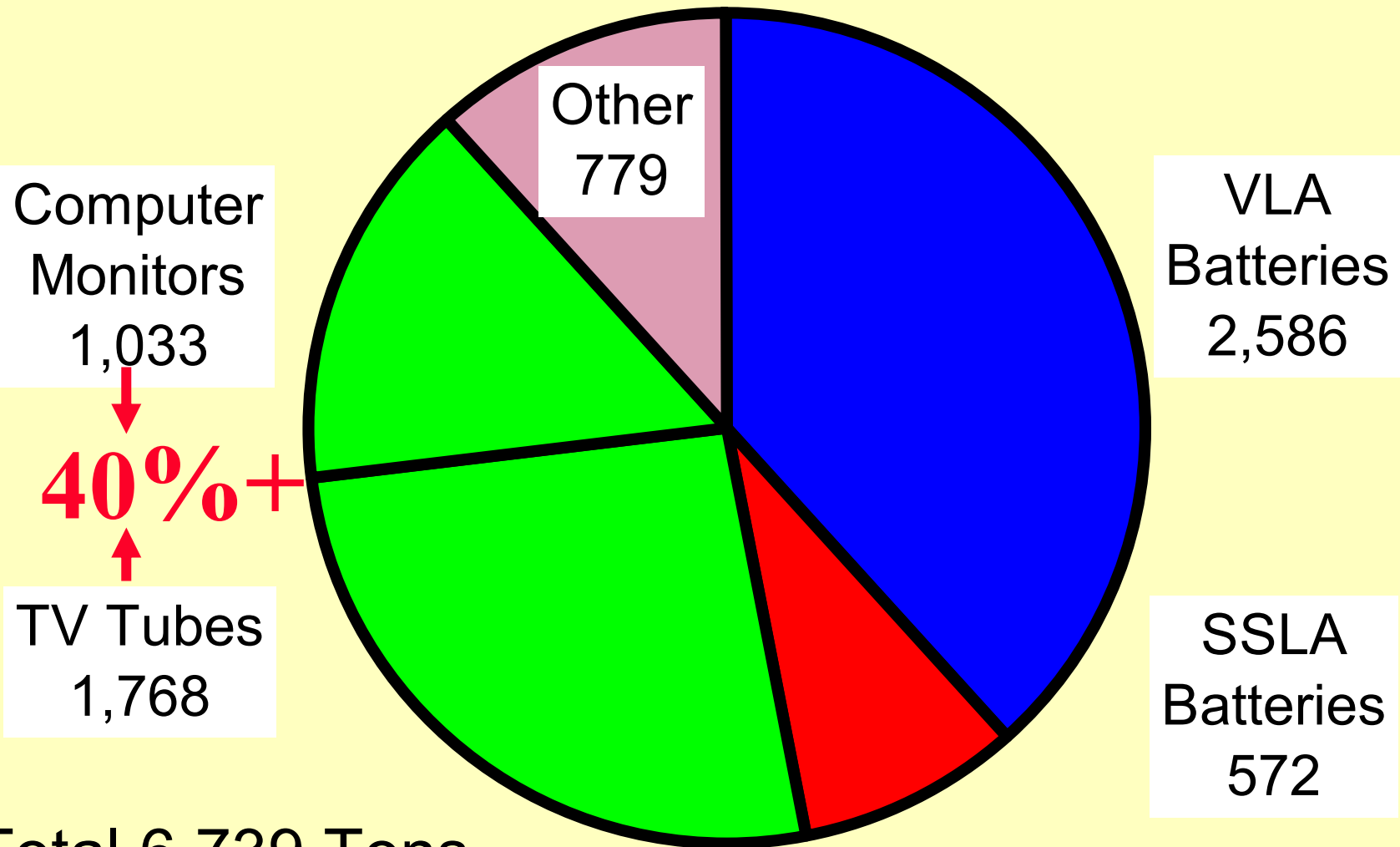
CRT Components



FACTOID

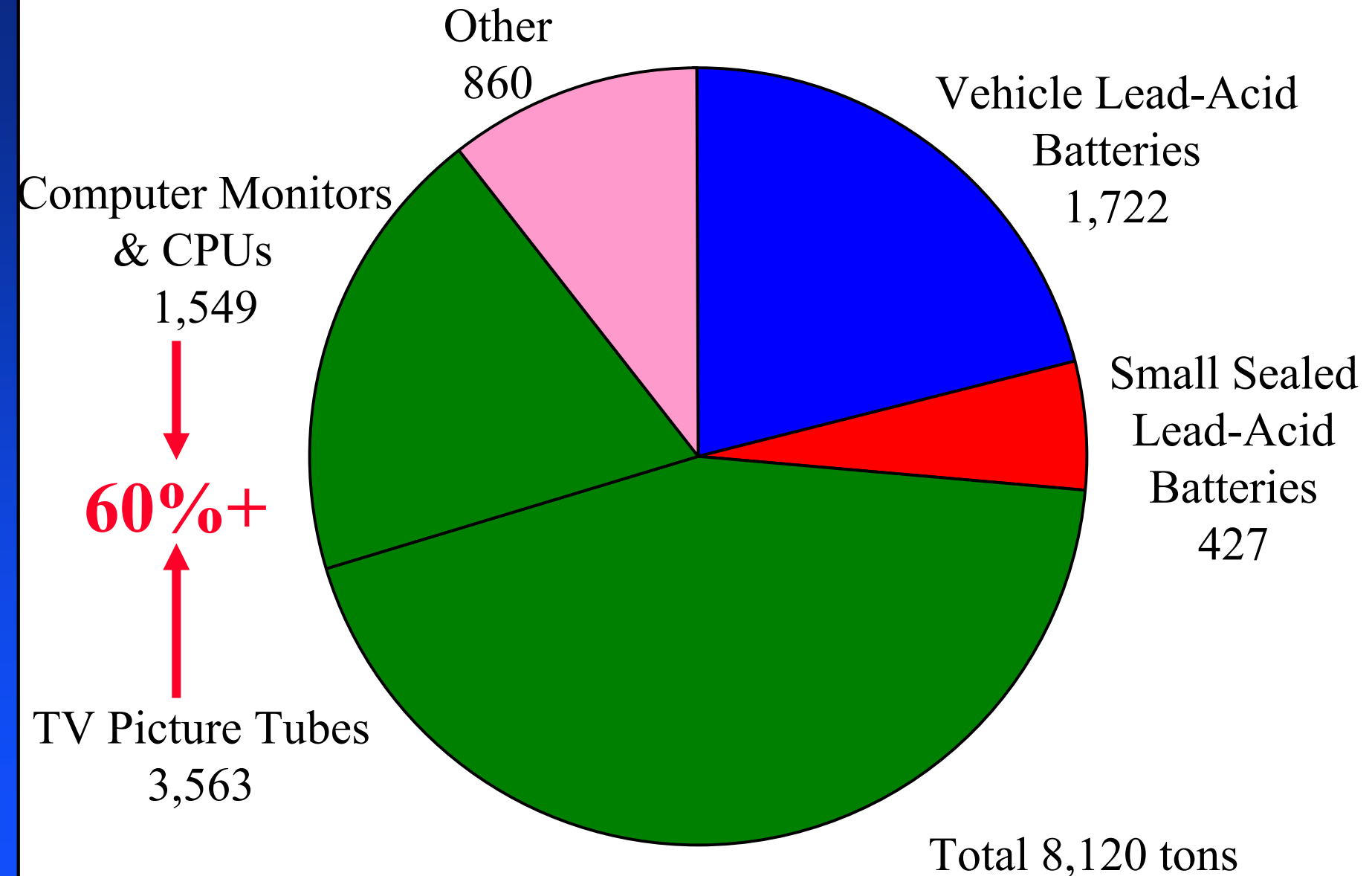
- By 2006 there may be up to 439,000 CPUs landfilled in Florida, 731,000 recycled and more than 5,000,000 stored for eventual discard or recycling (DEP 2003)

Sources of Pb in FL MSW, 2000 (Est.)



Total 6,739 Tons

Sources of Lead in Florida Solid Waste, 2001 (Est.)



Flat Panels and Laptops

- Most monitors are replaced due to convenience, NOT obsolescence or failure
- 35% of market share by 2005
- Use 2 fluorescent lamps,
average 4 milligrams of Hg
7,000 flat panels = 1 oz of Hg

Hazardous Waste?

■ Yes

■ CRTs

- UF ran TCLPs

- Pb toxicity

■ Other

- Hg relay switch

- Batteries

■ BUT not if...

■ Reused

- Not a Waste

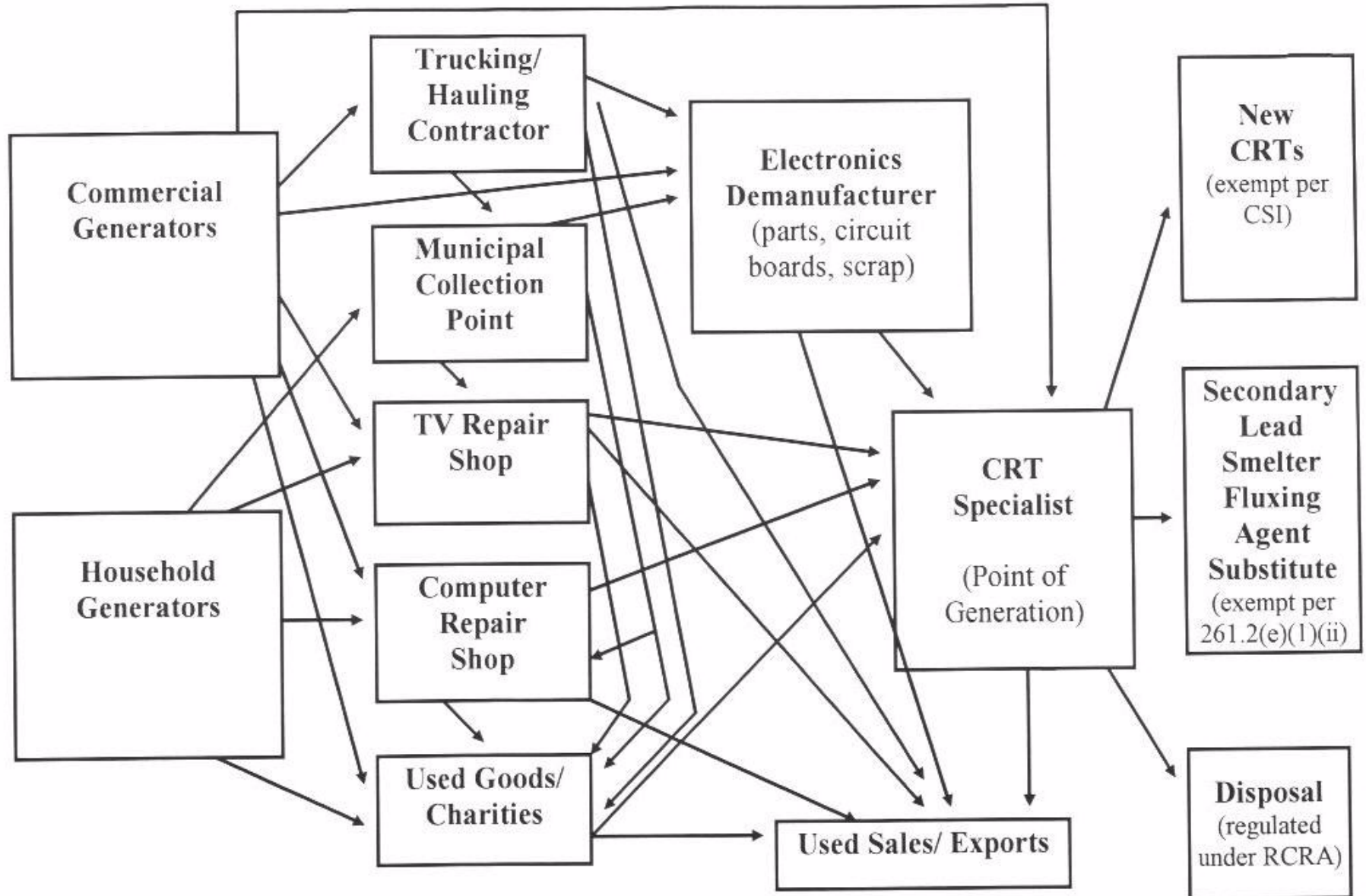
 - Point of Generation

■ Recycled

- Glass to Glass

- Lead Smelter

End of Life CRT Materials Flow



CRT Destinations

CRT Specialist

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graph TD; A[CRT Specialist] --> B[Resale]; A --> C[New CRTs]; A --> D[Lead Smelter]; A --> E[Disposal];
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Resale

New CRTs

Lead Smelter

Disposal

Glass-to-Glass

- New CRTs: CRT glass used as feedstock for making new CRTs
- Niche Products: Glass block or X-ray shielding

Secondary Lead Smelter

CRT glass used as
substitute for smelting
process flux (silica/sand)

Florida Electronics Recycling: Infrastructure Building 1998-2003

Pilots – 4 counties (1998-2000)	\$139,000 (HHW)
Grants – 6 counties (2000-2001)	\$895,000 (IRG)
Grants – 15 counties (2001-2003)	\$905,000 (403.71851 FS)
Countywide Demonstration (2002-2003)	\$200,000 (403.71851 FS)
Total	\$2,139,000

Electronics Recycling Projects



2002-2003 Countywide Recycling
Demonstration Project Grant (403.71851, FS)



2002-2003 Lead-Containing
Materials Grants (403.71851, FS)



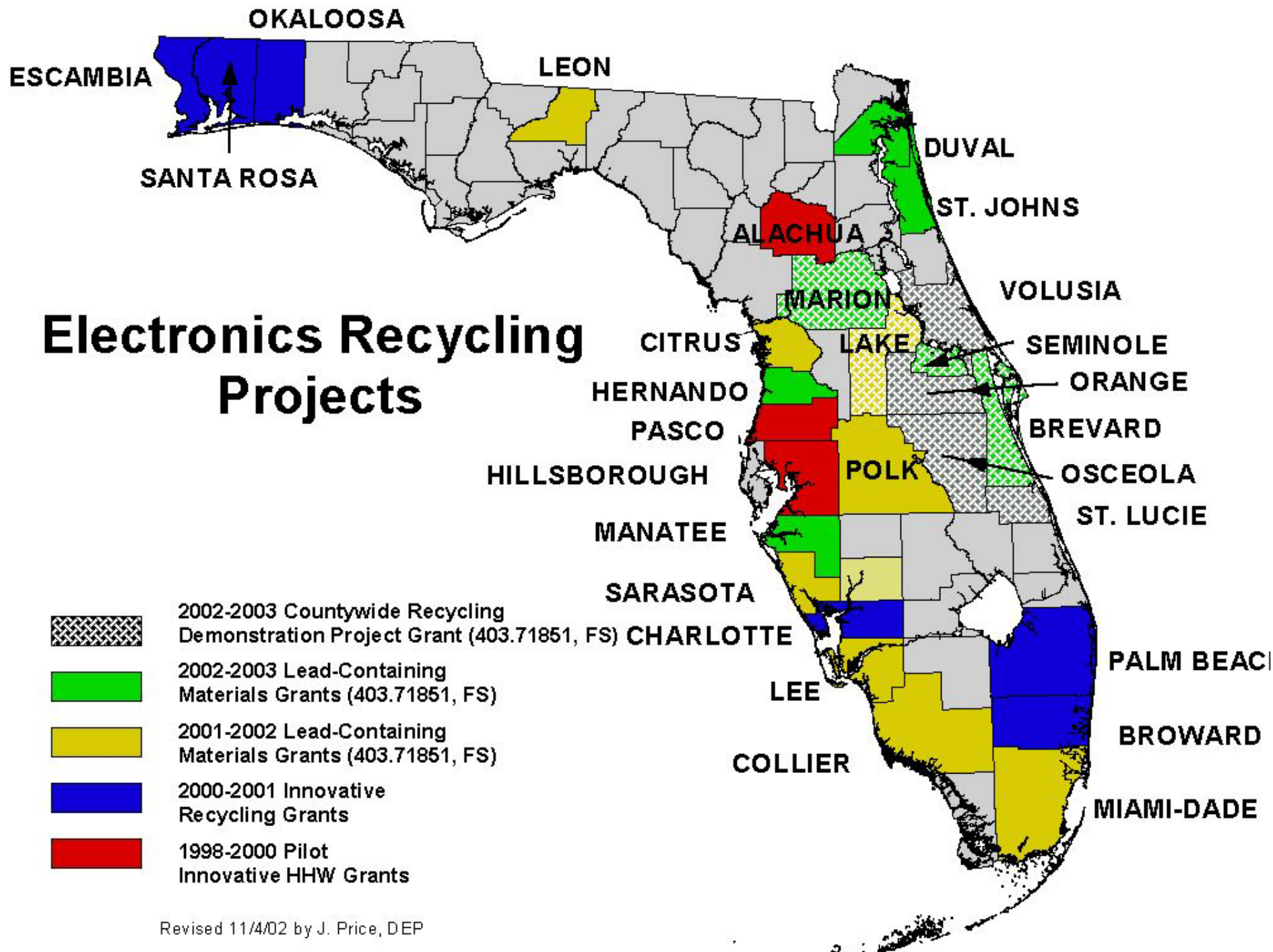
2001-2002 Lead-Containing
Materials Grants (403.71851, FS)



2000-2001 Innovative
Recycling Grants



1998-2000 Pilot
Innovative HHW Grants



Florida Electronics Recycling: Program Variation

- Collection Events (many counties)
- Rural 3 county cooperative (Escambia, Okaloosa, Santa Rosa)
- Curbside (Sarasota)
- Ongoing Neighborhood Dropoffs (Miami-Dade)
- Comprehensive Countywide Demonstration Project (Private vendor; Orange County focus with a variety of additional services to other counties in the region and around the state)

Past HHW Funding County Pilot Projects

- Alachua: Collection Events (now ongoing)
- Hillsborough: Computers to Kids
- Pasco: Ongoing Unadvertised Collection and Separation
- Pinellas: Ongoing Advertised Collection and Events w/Contractor

Past Innovative Recycling Grant Funding County Projects

- Escambia, Santa Rosa and Okaloosa: Regional Project
- Palm Beach, Broward: Business Reuse Project
- Charlotte: Goodwill Project

Past “Lead Grant” Funding County Projects

- Miami-Dade, Lake: Ongoing - HHW Centers & Satellites
- Citrus, Lee: Collection Events
- Collier, Polk : Events & Drop-off Centers
- Sarasota: Curbside Collection
- Charlotte, Leon: Goodwill Partnership

Most electronics recycling programs are ongoing under county funding

Current “Lead Grant” Funding County Projects

- Manatee
- St. Johns
- Hernando
- Duval
- Brevard
- Seminole
- Marion
- Leon
(Goodwill)

State Electronics Recycling Contract

- Onyx Special Services
1-800-376-7888
- Best Buy Collections in October
 - Sat. 4 Pinellas
 - Sat. 11 Seminole
 - Fri. and Sat. 17/18 Alachua
 - Sat. 25 Indian River

Demanufacturers and Recyclers:

- Creative Recycling Systems (Tampa)
- Global Investment Recovery (Tampa)
- E-Scrap, Inc. (Miami)
- Jack's Recycling (Jacksonville)
- Quicksilver Recycling Services (Tampa)
- RecycledPCparts.com (Miami)
- S.E.E.R. (Tampa)
- UNICOR (Marianna)

Minimum Vendor Requirements

■ EPA ID Number Registration

- Universal Waste Notification
- Hg Handler Registration

■ Insurance

- General Liability Insurance
- Workman's Compensation
- Hold Harmless Endorsement

Minimum Vendor Requirements

(continued)

- Documentation of End Markets for Equipment, Recovered Components and Materials
 - Subcontractor Agreement
 - Letter from Subcontractor
 - Sworn Affidavit
- Exporting- paid > token value

Opportunities to Donate Used Equipment

A list of Florida-based organizations accepting donations

[www.dep.state.fl.us/waste/
categories/electronics](http://www.dep.state.fl.us/waste/categories/electronics)



Jeb Bush
Governor

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

BEWARE!! NOTICE

Buyers or Recipients of Discarded Electronics

RCRA and Superfund Regulations Apply

If your company buys or receives donations of discarded electronics (individual components or "as is" palletized quantities) such as televisions, computers, computer monitors, and telecommunications equipment, disposal of what's left over after you separate out the working or repairable units and any sellable components (processor/memory chips, drives, power supplies) is subject to hazardous waste regulations. Here is a brief list of units/components in electronic scrap that may contain hazardous wastes.

Televisions and Computer Monitors

The cathode ray tube (CRT) in televisions and computer monitors contains enough lead to make it a hazardous waste.

CPUs and UPSs

Computer central processing units (CPU) and uninterruptible power supplies (UPS) may contain hazardous waste batteries (nickel cadmium and small sealed lead acid).

Circuit Boards

Circuit boards contain lead and cadmium and other heavy metals and may have mercury relays attached to them.

If you dispose of CRTs, rechargeable nickel-cadmium and small sealed lead acid batteries, mercury relays or circuit boards, you are subject to and responsible for following all applicable hazardous waste regulations. Rechargeable nickel-cadmium and small sealed lead acid batteries and mercury relays cannot be disposed in a Florida landfill or municipal waste combustor (incinerator) in any quantity. CRTs and circuit boards also cannot be disposed, depending on the quantity. Besides being a violation of Florida's hazardous waste regulations, improper disposal of these items may subject you to federal Superfund liability for the very high costs of cleanups.

If you recycle these items, they are not considered hazardous wastes.

All of these items can be recycled, many at no or low costs. Recycling at properly run recycling facilities also reduces your potential Superfund liability to near zero since the recovered materials are reused rather than placed in a landfill or burned. Recycling reduces the chance that hazardous constituents in these materials may pollute the water, land or air.

Avoid Hazardous Waste and Superfund Liability: Recycle

For more information, visit the DEP electronics website at www.dep.state.fl.us/dwm/programs/electronics or call 850-488-0300.

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.

Cooperation and Flexibility

- Cooperation with counties, manufacturers, reusers, recyclers and other players
- Flexibility with management scenarios, regulations and the final “system”

National Electronics Product Stewardship Initiative

NEPSI started in June 2001 with 48 stakeholders representing:

- 15 manufacturers
- 15 state, local & federal government reps
- 18 'others,' including recyclers, NGOs, retailers, etc.
- Have met 7 times through June 2003; next meeting scheduled for Sept 23-24, 2003
- Patterned after the successful Carpet Dialogue

NEPSI, cont.

- Goal: the development of a system, including a viable financing mechanism, to maximize the collection, reuse, and recycling of used electronics, while considering appropriate incentives to design products that facilitate source reduction, reuse and recycling; reduce toxicity; and increase recycled content.

Major NEPSI Issues— Consensus Reached

- Scope of Products shall include:
 - Computer monitors
 - Televisions
 - CPUs & laptops
 - Some peripherals
- Source of Products shall include individuals and small businesses/organizations (< 5 items)

Major NEPSI Issues—Consensus Reached

- System Likely to Include Both an Interim and an Ultimate Phase
- Solution will be a Shared Responsibility Outcome

Major NEPSI Models Developed

- Advanced Recovery Fee (ARF)
- Partial Cost Internalization (PCI)
- Hybrid System (ARF 'transitions into PCI)

Most work is towards a compromise on
how to finance the system

Current Status of Talks

- June 2003: Full stakeholder group agreed on the 'Hybrid' model (HP and Dell voted for PCI)
- September 2003: HP and Dell continued preference for PCI instead of Hybrid; full stakeholder group agreed to an interim system
- December stakeholder meeting may agree to some kind of agreement, not necessarily a national system, pending (mostly) Dell and/or HP support
- Drafting of model national legislation continues for implementing different types of systems

Features of the Hybrid System

- The “hybrid” model is a two-phase system that begins with an Advanced Recovery Fee (ARF), and evolves to a Partial Cost Internalization (PCI) phase
- Rationale for this system is that the ARF can be used to more equitably cover the costs of managing orphan/historic waste, and that the PCI phase can drive design improvements

Features of the Hybrid System

- Allows Flexibility for “individual responsibility”
- Requires Federal Legislation

Features of the Hybrid System (ARF Phase)

- Sets a visible, national fee on all NEPSI products
- Fee would be applied at all points of sale, collected from consumers at purchase, and passed into a trust fund.
- The ARF would cover the basic collection service, transportation, & recycling/processing (for all products)

ARF Phase (continued)

- Authorizes a “third-party organization” (TPO)
- In this system, government is essentially responsible for products being collected
- The ARF would sunset after a specified period or when certain conditions were met

Features of the Hybrid System

PCI Phase

- PCI Phase: A portion of the management costs would be “internalized” by manufacturers, with government responsible for the remainder of the costs.

Common Features in Both Phases of the Hybrid System

- National performance measures (recovery & recycling goals)
- Enforcement to achieve level playing field
- ESM standards for recyclers, etc.
- Pre-emption of certain state legislation
- Anti-trust protection
- Consumer education/awareness program

Conclusions—Is there a likely NEPSI Solution?

- There is still considerable ongoing work on a NEPSI system
- Possible “agreement” by the end of 2003
- If no solution in the short term, there will likely be partnerships to provide regional solutions or a nationally coordinated interim system

MAJOR ELECTRONICS INITIATIVES

- ❑ State Legislation: AR, CA, FL, GA, MA, ME, MI, MN, NC, NE, NH, NJ, OR, SC, TX, UT, VA, WA
- ❑ U.S. Congress
Senator Thompson bill
- ❑ NGO bill - Computer Takeback Campaign

MAJOR ELECTRONIC INITIATIVES

■ State Legislation:

- 7 bills include an ARF (\$5-\$50)

- 4 bills call for full takeback

- 3 bills ban exports

- 2 bills ban prison labor

- 3 bills ban heavy metals and BFRs

Most bills ban CRTs from SW stream and most allow preemption for a National system

Why States Find State Legislation To Be Necessary

- NEPSI pace not kept up with local demand
- Brings more immediate relief to state
- Lets states figure out what works for them within national context
- States will drive national solution
- State legislation can be preempted by national solution

FLORIDA

- 2003 Legislative Session
- Senate Bill 674
- Senator Campbell

Democrat from Broward

Proposed “Management of End-of-Life Electronic Products” Bill

- Section (1) defines “covered electronic product” (primarily televisions, computer monitors and computer central processing units)
- Section (2) prohibits the incineration or disposal of covered electronic products from household and commercial users. The prohibition would be effective January 1, 2004 (January 1, 2006 small counties).

Proposed “Management of End-of-Life Electronic Products” Bill (con.)

- Section (3) provides funding for county electronics recycling programs via time-limited state grants; an advance recycling fee collected at retail and returned to counties annually, providing that the county has established an electronics recycling program; and a solid waste disposal fee surcharge collected and retained by the counties

Proposed “Management of End-of-Life Electronic Products” Bill (con.)

- Section (4) requires marketers that sell covered electronics products in Florida to implement a product management system to collect and recycle these products by date certain.

Proposed “Management of End-of-Life Electronic Products” Bill (con.)

- Section (5) creates a Review Council to review the list of covered electronic products; the need for and level of advance recycling fees, solid waste fee surcharges and grant funding; the effectiveness of and requirements for marketer product management systems, other.

ENDING FACTOIDS

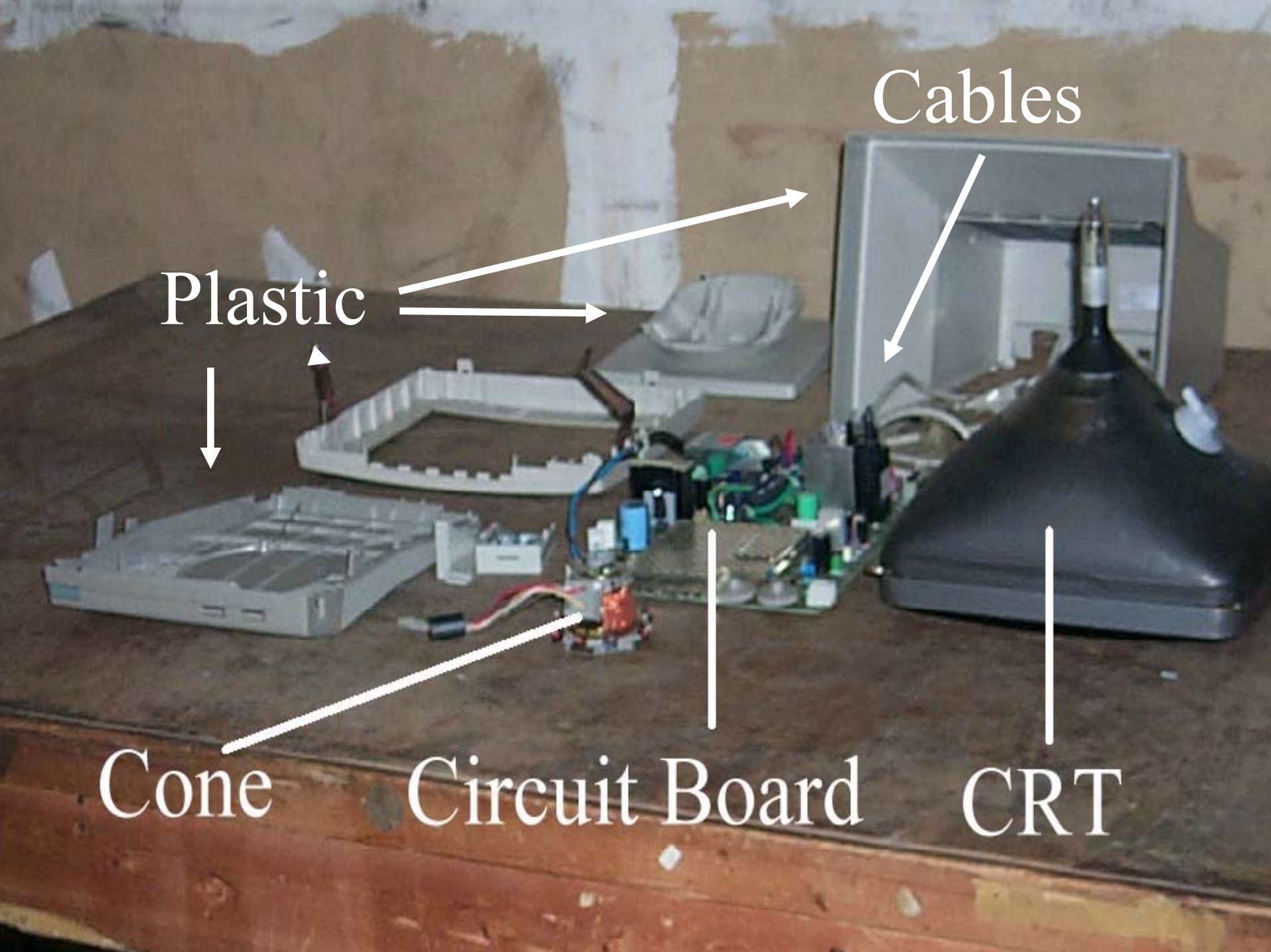
- 20,000 computer items are sold daily on E-Bay
- Dell and HP control 52% of the US computer market (17% and 16% worldwide)
- Panasonic is the only electronics maker to receive the Energy Star Partner 5 years in a row
- About 400 electronics recyclers in the US process 71.5 billion lbs. of e-scrap/year

The Future of Electronics Recycling and Disposal?









Cables

Plastic

Cone

Circuit Board

CRT

The Future of Electronics Recycling and Disposal?

Recycling or Disposal: That
depends on us

DEP Contacts with a Pulse (Human or Electronic)

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john.l.price@dep.state.fl.us

[www.dep.state.fl.us/waste/
categories/electronics](http://www.dep.state.fl.us/waste/categories/electronics)